REMARKS

Applicants respectfully submit this Amendment in response to the Office Action dated December 9, 2008, and courteously solicit favorable reconsideration followed by a Notice of Allowance.

Amended claim 1 finds basis in the original specification and there is no new matter. The specification makes clear that those skilled in the art are familiar with the terminology recited in part (C) in original claim 1, and attention is invited to page 11, lines 13-15, and, for example, to page 11, lines 14-15. The molecular weight range recited in part (C) is disclosed at page 13, line 22, bridging to page 14, line 15, noting page 14, line 1, in particular, along with original claim 5. As to the recitation of the phosphorus-containing flame retardant, the vocabulary used does not contract the claim scope, and therefore there is no estoppel against Applicants.

Applicants submit a Declaration Under 37 C.F.R. §1.132.

Applicants respectfully submit claims 1-3 and 6-9 define unobvious inventions of U.S. Patent No. 4,892,893 (Grace) in view of PCT International Publication WO 03/078497.

Applicants submit (i) the references would not have been combined, (ii) even if they were the present inventions would not have been obvious to a person of ordinary skill in the art, and (iii) even if there is a *prima facie* case, it has been rebutted. The combination of elements recited in Applicants' claim 1 would not have been foreseen from the primary reference, nor would they have been foreseen from the secondary reference, and thus the elements as combined in claim 1 would not have been obvious even if for the sake of argument the references would have been combined.

A primary object of the present invention is to provide a novel composition for a flame-retardant flexible polyurethane foam comprising a melamine-based flame retardant, the composition being capable of providing sufficient flame retardancy even when using a general-purpose polyol, without requiring the use of a special modified polyol.

According to the composition for flame-retardant flexible polyurethane foam of the present invention, a flexible polyurethane foam with superior flame retardancy can be obtained. The polyurethane foam can have a low density (e.g., about 25 kg/m^3) but none-the-less exhibits sufficiently high flame retardancy that complies with standards for flame retardancy, for example, British standard BS 5852. The bulk density of this foam is about 25 to 50 kg/m^3, and preferably 25 to 35 kg/m^3.

According to the present invention, although a general-purpose polyether polyol is usable as a polyol component, a polyurethane foam with excellent flame retardancy is obtained by using a combination of a melamine-based flame retardancy having a specific average particle diameter and an additive-type phosphorus-containing flame retardant. The flame retardancy of this polyurethane foam can be increased even more by using a silicone foam stabilizer as a foam stabilizer. The foam of the present invention, despite using a general-purpose polyether polyol, exhibits excellent flame retardancy that satisfies, for example, the stringent criteria of BS 5852

In the present composition, the melamine-based flame retardant having an average particle diameter of about 30 to 60 μm, when used in conjunction with an additive-type phosphorus-containing flame retardant described later, i.e., component (C), enables a foam with excellent flame retardancy to be obtained while maintaining other properties desired of the foam (such as elongation and tensile strength), even though a general-purpose polyether polyol is used as the polyol component.

As to part (B) – the melamine component, if an average particle diameter exceeds 60 μm or is less than 30 μm, the composition fails to provide sufficient flame retardancy to the resulting foam. Specification, page 9, lines 18-20.

When the phosphorus-containing flame retardant is used in combination with the above-described melamine-based flame retardant having a specific particle diameter, i.e., component (B), a highly flame-retardant foam to be obtained even though the amount of the melamine – based flame retardant is not large. Specification, page 11, lines 6-11.

Specifically, use of a silicone foam stabilizer in conjunction with the above-described melamine-based flame retardant and additive-type phosphorus-containing flame retardant contributes to the increased flame retardancy. Specification, page 18, lines 4-8.

The primary reference to **Grace** discloses flame retardant polyurethane foams containing melamine and phosphorus-containing retardant, but the reference does not disclose and does not teach controlling melamine particle size to maintain system stability.

The secondary **PCT International publication** nowhere discloses the relationship between average particle size of melamine and the flame retardancy of polyurethane foam. WO 03/078497 discloses that the melamine has a minimum particle diameter of about 0.83 μm, a maximum particle diameter of about 74 μm, and an average particle diameter of about 12.28 μm (paragraph [0017]). *When the average particle diameter is 12 μm (i.e., the particle diameter defined by WO '497, the final product cannot meet the requirements British Standard 5852 (Comparative Example 1). In contrast,* the melamine-based flame-retardant used in Applicants' presently claimed invention has an average particle diameter of 30-60 μm, which clearly is different from the disclosure of WO 03/078497. As shown in Example 1 and Comparative Example 3 in Table 2 of the present specification, when the average particle diameter of melamine is 45 μm (i.e., within the range of the particle diameter of the present invention), the final product can meet the criteria of both British Standard 5852 and CAL 117 (Examples 1 and 2).

On the other hand, in the present invention has flame retardancy of the polyurethane foam is improved by using melamine-based flame retardants having the recited average particle diameters. The combination of elements in claim 1 yields an unforeseen benefit as reported in Example 1 of the present application. Specification, page 34 (summary); page 36 (summary); page 38 (summary). Applicants invite attention to their Table 1, Example 1, Comparative Example 1 and Comparative Example 2.

As to the silicone foam stabilizer, neither the primary Grace reference, nor the secondary **PCT International publication**, disclose or suggest the requirements for this silicone foam stabilizer and its combination with Applicants' (B) and (C) components, to m

mention but two components as examples from the seven components in claim 1, to achieve the remarkable flame retardancy for the polyurethane foam.

Applicants' part (F) is "0.1 to 3 parts by weight of a silicone foam stabilizer with a surface tension of 20.5 to 22 mN/m at a temperature of 25°C and a silicon atom content not exceeding 4.7% by weight" and it is not described or suggested by either reference, and even, if for the sake of argument, the references were combined, the part (F) alone or in combination with parts (A), (B), (C), (D), (E), and (G) would not have been suggested to a person of ordinary skill in the art.

Grace discloses that non-ionic surfactants, such as silicones, are not particularly desirable. See column 7, line 60, through column 8, line 4. While the Grace surfactant may superficially resemble Applicants' silicone foam stabilizer, the Grace surfactant is not a low activity silicone, as in the presently claimed invention. See page 18, lines 9-19, of the present specification. Furthermore, Grace makes no mention of the British Standard 5852; the only inflammability test conducted in Grace is the CAL 117.

Furthermore, even if the **Grace** and **PCT International publication** would have been combined, which is not conceded, Applicants have rebutted the asserted *prima facie* case. Applicants additionally invite attention to the Rule 132 Declaration, which shows that the flame retardancy of polyurethane foam is improved only when the specified silicone foam stabilizers are used. Thus, even if the asserted "expectancy" (Office Action, page 4, lines 1-4) were valid, which it is not, it is rebutted.

Lastly, Applicants are struck by the naked hindsight reasoning articulated in the Office Action. Without Applicants disclosure and without Applicants claims there is no factual basis for asserting a person would have taken Grace with preconceive notion "in order to arrive at the products of applicants' claims..." (Office Action, page 3). Applicants discovered a result and discovered the means to achieve it, which are not within the four corners of either reference. Yet, the Office Action posits a rote theory of obviousness teased from the *In re Boesch* case that is beyond what the court said, is refuted by the U.S. Supreme

Court's decision in the *Eible Process* case, and is lacking in any statutory authority. *Eibel Process Co. v. Minnesota & Ont. Paper Co.*, 261 U.S. 45 (1923) (patent sustained even though discovery of the problem, simple though it may have been in retrospect, and the resultant solution, was also simple). Indeed, the obviousness statute dictates that an invention is not negatived by the manner in which it is made, whereby the theories espoused in the Office Action are barred by the statute in question. *In re Fay*, 146 USPQ 47 (CCPA 1965) ("Oft repeated rules, like oft repeated myths, seem to die hard" and "we do not agree that "routine experimentation" negatives patentability. The last sentence of section 103 states that "patentability shall not be negatived by the manner in which the invention was made."). The PTO must apply the statute as written, and the theories in the Office Action are contradicted by the statutory command of 35 U.S.C. 103(a), last sentence.

A notice of allowance is courteously solicited.

Respectfully submitted,

FITCH, EVEN, TABIN & FLANNERY

Kendrew H. Colton, Reg. No. 30,368
(202) 419-7000 telephone
(202) 419-7007 facsimile

Customer No. 42798
One Lafayette Centre
1120 - 20th Street, NW
Suite 750, South
Washington, DC 20036